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10/574,670	03/31/2006	Norio Koma	YKI-0203	1761

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EXAMINER	
MOY, ANNIE	
ART UNIT	**PAPER NUMBER**
2629	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/574,670	KOMA, NORIO	
	Examiner	Art Unit	
	ANNIE MOY	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *3/31/06*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/30/2006,3/31/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3-6, 8-10, 12 -15, 19, 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Rei Hasegawa (U.S 6,219,019 B1 "Hasegawa" hereinafter).

Regarding **claim 1**, Hasegawa teaches a method of driving a liquid crystal display device in which two substrates having respective electrodes for driving liquid crystal on opposing surfaces are provided opposing each other with a liquid crystal layer there between and comprising a plurality of pixels, the method comprising: (Hasegawa, See column 4 lines 5-12, i.e. the LCD display has a pixel and common electrode)

applying a liquid crystal drive voltage to the liquid crystal layer in each pixel; and (Hasegawa, See column 4 lines 5-12, i.e. voltage are applied to the pixel electrodes)

maintaining the liquid crystal drive voltage at a same polarity with respect to a predetermined reference for a period of two frame periods or longer. (Hasegawa, See column 17 lines 66-67).

Regarding **claim 10**, Hasegawa teaches a liquid crystal display device in which two substrates having respective electrodes for driving liquid crystal on opposing surfaces are provided opposing each other with a liquid crystal layer there between and

comprising a plurality of pixels, the liquid crystal display device comprising: (Hasegawa, See column 4 lines 5-12, i.e. the LCD display has pixel and common electrodes)

a liquid crystal drive signal processor which generates a liquid crystal drive voltage to be applied to the liquid crystal layer on the basis of an image signal; and (Hasegawa, See column 9 lines 47-54, i.e. there is a displayed image which is sent to the drivers and a polarity voltage is generated based on the display signal)

a predetermined period determination unit which determines elapse of a predetermined period which is two frame periods or longer and outputs a polarity inversion control signal for inverting a polarity of the liquid crystal drive voltage, wherein (Hasegawa, See column 9 lines 55-63 and column 14 lines 11-16, i.e. there is a period that is set for when a frame is inverted. Frames can be inverted every two frames.);

the liquid crystal drive signal processor inverts the polarity of the liquid crystal drive voltage according to the polarity inversion control signal, and (Hasegawa, See column 9 lines 51-60, i.e. the polarity controller sends a signal control signal for the polarity to be inverted);

a polarity of the liquid crystal drive voltage applied to the liquid crystal layer with respect to a predetermined reference is maintained at a same polarity in each pixel for a period of two frame periods or longer. (Hasegawa, See column 4 lines 5-24 and column 17 lines 66-67, i.e. the pixel electrode and common electrode are used to invert polarity and polarity are held for two frames. The voltage is applied to the pixel and common electrode at the same time).

Regarding **claim 3**, in rejection of parent claim 1, Hasegawa teaches a method of driving a liquid crystal display device according to claim 1, wherein a polarity of the liquid crystal drive voltage is inverted with a minimum unit of a screen drive period which corresponds to a drive period of all pixels of the plurality of pixels. (Hasegawa, See column 9 lines 47-53, 56-63 and columns 10 lines 12-14 and column 11 lines 5-14, i.e. the polarity inversion controller is used to invert the polarity of all the pixels during the drive period every other frame)

As for **claim 4 and 12**, in rejection of parent claim 1 and 10 Hasegawa teaches a liquid crystal device and a method of driving the liquid crystal display device according to claim 1 and 10, wherein

a period t over which the liquid crystal drive voltage is applied at a same polarity is set to a period which is shorter than or equal to a period in which a relationship between a maximum application voltage Vpmax which is applied to the liquid crystal layer and a residual direct current voltage Vdc generated in the liquid crystal layer when the maximum application voltage Vpmax is applied to the liquid crystal layer at a same polarity for the period t satisfies the following equation: Vdc <= 0.1*Vpmax (Hasegawa, See column 17 lines 66-67, i.e. It is inherent that VDC will be less than .1*Vpmax when the polarity are inverted every two frames. It is inherent that inverting polarity from time to time will get rid of residual DC because inverting the polarity help keeps the charges from sticking to the walls which causes residual DC)

As for **claim 5**, in rejection of parent claim 1, Hasegawa teaches a method of driving a liquid crystal display device according to claim 1, wherein application times of the liquid crystal drive voltage for a positive polarity which is applied to the liquid crystal layer and the liquid crystal drive voltage of a negative polarity which is applied to the liquid crystal layer are set equal to each other. (Hasegawa, See Figure 6d item 40a, 40B , column 12 lines 60-62 and column 13 lines 9-11)

As for **claim 6**, in rejection of parent claim 1, Hasegawa teaches a method of driving a liquid crystal display device according to claim 1, wherein

the liquid crystal display device has a characteristic such that a transmittance with respect to an application voltage has a minimum value, and (Hasegawa, See column 6 lines 43-55, i.e. where there is no voltage applied for the molecules for a certain state).

an electrode potential of the opposing substrate is set such that an absolute value of a potential difference becomes equal in a period in which a polarity of a liquid crystal drive potential applied to the liquid crystal layer with respect to the electrode potential of the opposing substrate is a positive polarity and in a period in which the polarity of the liquid crystal drive potential applied to the liquid crystal layer with respect to the electrode potential of the opposing substrate is a negative polarity in a black display. (Hasegawa, See column 7 lines 13 – 20 and column 8 lines 25-30, i.e. where during the black display a +5 and -5 voltage is applied to the substrates)

As for **claim 8**, in rejection of parent claim 1, Hasegawa teaches a method of driving a liquid crystal display device according to claim 1, wherein a polarity of a voltage applied to a pixel electrode formed individually for each of the plurality of pixels with respect to a predetermined reference is inverted at the period of two frame periods or longer and a voltage applied to a common electrode which opposes the pixel electrode with the liquid crystal layer there between is set to a constant, so that a polarity of a liquid crystal drive voltage applied to the liquid crystal layer with respect to a predetermined reference is inverted at the period of two frame periods or longer. (Hasegawa, See column 4 lines 5-24 and column 17 lines 66-67, i.e. the pixel electrode and common electrode are used to invert polarity and polarity are held for two frames)

As for **claim 9**, in rejection of parent claim 1, Hasegawa teaches a method of driving a liquid crystal display device according to claim 1, wherein

a polarity of a voltage applied to a pixel electrode formed individually for each of the plurality of pixels with respect to a predetermined reference is inverted at the period of two frame periods or longer, and (Hasegawa, See column 4 lines 5-24 and column 17 lines 66-67, i.e. the pixel electrode and common electrode are used to invert polarity and polarity are held for two frames. The voltage is applied to the pixel and common electrode at the same time)

a polarity of a voltage applied to a common electrode which opposes the pixel electrode with the liquid crystal layer there between is inverted in synchronization with the inversion of the polarity of the voltage applied to the pixel electrode. (Hasegawa,

See column 4 lines 5-24 and column 17 lines 66-67, i.e. the pixel electrode and common electrode are used to invert polarity and polarity are held for two frames. The voltage is applied to the pixel and common electrode at the same time)

As for **claim 13**, in rejection of parent claim 10, Hasegawa teaches a liquid crystal display device according to claim 10, wherein a period determined by the predetermined period determination unit is set to a period so that application times of the liquid crystal drive voltage of a positive polarity applied to the liquid crystal layer and of the liquid crystal drive voltage of a negative polarity applied to the liquid crystal layer are equal to each other. (Hasegawa See, figure 6B and 6C and column 9 lines 13-20)

As for **claim 14**, in rejection of parent claim 10, Hasegawa teaches a liquid crystal display device according to claim 10, further comprising:

a setter unit which arbitrarily sets the determination period in the predetermined period determination unit. (Hasegawa, See column 19 lines 20-24and lines 57- 62, i.e. there is a display timing controller which controls operation and the timing signal of the display signal. The timing controller controls the polarity inversion signal which comes from the polarity controller. The controller would then set the time for applying a polarity inversion signal).

As for **claim 15,** in rejection of parent claim 10, Hasegawa teaches a liquid crystal display device according to claim 10, wherein

the liquid crystal display device has a characteristic in which transmittance with respect to an application voltage to the liquid crystal layer has a minimum value,

the liquid crystal display device further comprises an opposing electrode driver which drives an electrode on an opposing substrate, and (Hasegawa, See Fig 4 and column 7 lines 13-21 and column 9 lines 13- 20 and where you have drivers to drive pixels and common electrodes)

the opposing electrode driver sets an electrode potential of the opposing substrate so that an absolute value of a potential difference is equal during a period in which a polarity of a liquid crystal drive potential applied to the liquid crystal layer with respect to the electrode potential of the opposing substrate is a positive polarity and in a period in which the polarity of the liquid crystal drive potential applied to the liquid crystal layer with respect to the electrode potential of the opposing substrate is a negative polarity during black display. (Hasegawa, See column 7 lines 13 – 20 and column 8 lines 25-30, i.e. where during the black display a +5 and -5 voltage is applied to the substrates)

Regarding **claim 19**, Hasegawa teaches a driver device of a liquid crystal display panel in which two substrates having respective electrodes for driving liquid crystal on opposing surfaces are provided opposing each other with a liquid crystal layer there between and comprising a plurality of pixels, the driver device comprising: (Hasegawa, See column 4 lines 5-12, i.e. the LCD display has pixel and common electrodes)

a liquid crystal drive signal processor which generates a liquid crystal drive voltage to be applied to the liquid crystal layer on the basis of an image signal, and

(Hasegawa, See column 9 lines 47-54, i.e. there is a display image which is sent to the drivers and a polarity voltage is generated based on the display signal);

a predetermined period determination unit which determines elapse of a predetermined period which is two frame periods or longer and outputs a polarity inversion control signal for inverting a polarity of the liquid crystal drive voltage, wherein (Hasegawa, See column 9 lines 55-63 and column 14 lines 11-16, i.e. there is a period that is set for when a frame is inverted. Frames can be inverted every two frames.)

the liquid crystal drive signal processor comprises a polarity processor which inverts the polarity of the liquid crystal drive voltage on the basis of the polarity inversion control signal, and (Hasegawa, See column 9 lines 51-60, i.e. the polarity controller sends a signal control signal for the polarity to be inverted)

the liquid crystal drive voltage applied to the liquid crystal layer in each pixel is maintained at the same polarity with respect to a predetermined reference over a period of two frame periods or longer. (Hasegawa, See column 4 lines 5-24 and column 17 lines 66-67, i.e. the pixel electrode and common electrode are used to invert polarity and polarity are held for two frames. The voltage is applied to the pixel and common electrode at the same time)

As for **claim 21**, in rejection of parent claim 19, Hasegawa teaches a driver device of a liquid crystal display panel according to claim 19, further comprising:

a timing controller which generates a timing signal for controlling an operation timing at the liquid crystal display panel on the basis of a synchronization signal and a

predetermined clock signal supplied with the image signal, wherein (Hasegawa, See column 19 lines 20-24 and lines 57- 62, i.e. there is a display timing controller which controls operation and the timing signal of the display signal).

the timing controller also functions as the predetermined period determination unit, determines elapse of a predetermined period on the basis of the synchronization signal, and generates the inversion control signal. (Hasegawa, See column 19 lines 20-24and lines 57- 62, i.e. there is a timing controller which controls operation and the timing signal of the display signal. The display timing controller controls the polarity inversion signal which comes from the polarity controller. There is a line counter which counts the number of time the image is rewritten which means it counts the time the image was inverted).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 2, 11, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rei Hasegawa (U.S 6,219,019 B1 “Hasegawa” hereinafter) in view of Graham Andrew Cairns (U.S. 2002/0027541 A1 “Cairns” hereinafter).

Regarding **claim 2**, Hasegawa fails to teach wherein the liquid crystal drive voltage is maintained at the same polarity for a period of 10 seconds or longer as claimed.

However, Cairns teaches a method of driving a liquid crystal display device according to claim 1, wherein the liquid crystal drive voltage is maintained at the same polarity for a period of 10 seconds or longer. (Cairns, See paragraph 22, i.e. the image is static, so one can choose when to update the image. Since the image is static the polarity would be the same for 10 seconds or longer).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Hasegawa's LCD driving panel to include Cairns's panel for updating images because controlling the rate of the image being updates for high resolution and low resolution helps saves power consumptions.(Carins, See paragraph 22)

As for **claim 11 and 20**, Hasegawa teaches wherein the predetermined period determination unit determines elapse of a period of two frames for polarity inverting. (Hasegawa, See column 17 lines 65-67, a polarity inversion controller controls the period)

Hasegawa fails to teach the predetermined period determination unit determines elapse of a period of 10 seconds or longer, and the liquid crystal drive signal processor maintains the liquid crystal drive voltage at the same polarity for a period of 10 seconds or longer as claimed.

However, Cairns teaches wherein a polarity can be held of a period of 10 seconds or longer, and the liquid crystal drive signal processor maintains the liquid crystal drive voltage at the same polarity for a period of 10 seconds or longer. (Carins, See paragraph 22, i.e. the image is static, so one can choose when to update the image. Since the image is static the polarity would be the same for 10 seconds or longer.)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Hasegawa's LCD driving panel to include Cairns's determination unit for updating images because controlling the rate of the image being updates for high resolution and low resolution helps saves power consumptions.(Carins, See paragraph 22).

5. Claims 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rei Hasegawa (U.S 6,219,019 B1 "Hasegawa" hereinafter) in view of Hiroyuki Hebiguchi (U.S Patent 6,344,842 B1 "Hebiguchi" hereinafter).

As for **claim 16**, Hasegawa fails to teach an adjustor unit which adjusts the electrode potential of the opposing electrode which is set by the opposing electrode driver as claimed.

However, Hebiguchi teaches a liquid crystal display device according to claim 15, further comprising: an adjustor unit which adjusts the electrode potential of the opposing electrode which is set by the opposing electrode driver. (Hebiguchi, See column 6 lines 34-49, the signal line driving circuit controls the Vcom to output the voltage)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Hasegawa's LCD display panel to include Hebiguchi's driver which set an electrode potential because the potential determines whether it's a black or white display. (Hebiguchi, See column 6 lines 33 -49)

As for **claim 18,** Hasegawa fails to teach an opposing electrode driver which drives an electrode on the opposing substrate, wherein the opposing electrode driver comprises an opposing electrode drive voltage inverting unit which inverts a polarity of an electrode potential applied to the opposing substrate in synchronization with the inversion of polarity of the liquid crystal drive potential applied to the liquid crystal layer as claimed.

However, Hebiguchi teaches an opposing electrode driver which drives an electrode on the opposing substrate, wherein (Hebiguchi, See Column 6 lines 33-49, i.e. the signal-line driver drives the common electrode)

the opposing electrode driver comprises an opposing electrode drive voltage inverting unit which inverts a polarity of an electrode potential applied to the opposing substrate in synchronization with the inversion of polarity of the liquid crystal drive potential applied to the liquid crystal layer. (Hebiguchi, See column 6 lines 26-33, i.e. a voltage is applied when an inverting signal is applied).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Hasegawa's LCD display panel to include Hebiguchi's inverting unit because inverting the polarity of the liquid crystal display prevents residual current which affects the display. (Hebiguchi, See column 1 lines 31 -37)

6. Claims 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rei Hasegawa (U.S 6,219,019 B1 "Hasegawa" hereinafter) in view Hiroyuki Hebiguchi (U.S Patent 6,344,842 B1 "Hebiguchi" hereinafter) and Yoshio Maruoka (U.S. Patent 6,980,189 B2 "Maruoka" hereinafter).

As for **claim 7 and 17**, Hasegawa as modified by Hebiguchi fails to teach wherein the liquid crystal display device operates in an electrically controlled birefringence mode as claimed.

However, Maruoka teaches a liquid crystal display device according to claim 16, wherein the liquid crystal display device operates in an electrically controlled birefringence mode. (Maruoka, See column 31 lines 28-39)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Hasegawa's LCD display panel as modified by Hebiguchi to include Maruoka's birefringence mode because birefringence mode allows the change of images thru the change of light transmittance which helps form images on the LCD (Maruoka, See column 31 lines 28-39).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNIE MOY whose telephone number is (571)270-7175. The examiner can normally be reached on Monday- Friday 8-4pm CT.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571)-272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sumati Lefkowitz/
Supervisory Patent Examiner, Art Unit 2629

/A. M./
Examiner, Art Unit 2629